朝比奈泰彦*：地衣類雑記（§ 185）

Yasuhiko ASAHINA*: Lichenologische Notizen (§ 185)

§ 185. Preliminary Arrangement of Japanese *Nephroma* Species.

To prepare an uptodate arrangement of Japanese *Nephroma* species it is, first of all, important to settle whether *Nephroma tropicum* (Müll. Arg.) Zahlbr. is a mere synonym of *N. helveticum* Ach. or it should be accepted as an autonomous species.

Occasionally in the study of Kamtchatka lichens Du Rietz[1] mentioned seven *Nephroma* species from northern hemisphere and treated *N. tropicum* Müll. Arg. as well as *N. saxicolum* B. de Lesd. as synonyms of *N. helveticum* Ach. In his *Nephroma*-Studien Gyelnik[2] enumerated 18 species (including *N. arcticum*, *N. expallidum*, *N. lucitanicum*, *N. parile*, *N. helveticum* and *N. resupinatum*, all enumerated by Du Rietz). In the supplementary paper of Gyelnik[3] the species number of the genus *Nephroma* was augmented to 45, besides numerous varieties and forms. A few years later Gyelnik[4] discussed about the resemblance of *N. helveticum* Ach. with *N. tropicum* (Müll. Arg.) A. Zahlbr. and *N. denticulatum* (Vain.) Gyel. and on the basis of rather unimportant properties accepted the autonomy of *N. tropicum*.

Zahlbruckner[5] differentiated principally *N. tropicum* from *N. helveticum*. But his actual determination of specimens was not always constant. Inumaru[6] in his study on Japanese *Nephroma*-species essentially followed Gyelnik's system and established several new species, most of which became untenable under recent interpretation. In 1960 Wetmore[7] assigned, in his elaborate paper, *N.*

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1) Arkiv für Bot., **22** A: 5. 1929.
2) *Nephroma*-Studien in Hedwigia **72**: 1—30. 1932.
3) *Nephromae* novae et criticae in Annales de Cryptogamie Exotique, **4**: 121—149. 1931.
4) Annales Musei Nationalis Hungarici. p. 11, 1935.
5) Sym. Sinic. **3**: 86—87. 1930. Hawaiian Lichens I. Ark. fürBot. **31** A, p. 93. 1943.
6) Acta Phytotaxonomica et Geobotanica **8**: 223—228 et 237—240. 1939; Ibid. **9**: 51—63 et 238—242. 1940; Ibid. **10**: 64—70. 1941.
7) The Lichen Genus *Nephroma* in North and Middle America in the Publication of The Museum-Michigan State University (Biological Series) **11**: 373—451. 1960.

tropicum as a synonym of *N. helveticum* Ach.

To settle this problem it is necessary to examine carefully the type specimen of *N. tropicum* Müll. Arg.. By courtesy of Dr. Baehni (Genève) I have had a chance to examine several specimens of *Nephromium tropicum* identified by Müller Arg. himself. One of them has a label "*Nephromium tropicum* Müll. Arg". L. B. n. 559, Toowoomba, Queensland: Hartmann. F. v. Müller 1882. No doubt this is one of the various specimens, which was examined by Müller Arg. when he established *N. tropicum*. By further examination of the other 4 specimens together with 3 incomplete and doubtful ones I could grasp the real habit of *N. tropicum*. A specimen labelled "China, prope Hupeh: 8 Aug. Henry" is identical with a Japanese specimen Lichenes Yatabeani no. 214 collected in Nikko and identified as *N. tropicum* by Müller Arg.

On the other hand Dr. M. Hale was kind enough to send me 20 specimens of *Nephroma helveticum* preserved in U. S. National Museum on loan. They were all examined by Wetmore and 3 of them labelled by Wetmore as *N. helveticum* var. *sipeanum* (Gyel.) Wetmore correspond very well *N. tropicum* Müll. Arg.. Wetmore distinguished his var. *sipeanum* from type species by "the thicker thallus, longer, rounded isidia and teeth, and by the tendency for longer, more constant tomentum".

I think no. 14 *Nephromium helveticum* Ach. in the Tuckerman's Lichenes Americae Septentrionalis Exsiccati, which I possess, may be referred to *N. tropicum* Müll. Arg.. To distinguish *N. helveticum* v. *helveticum* from *N. tropicum* one must carefully examine the form and size of marginal teeth and size of

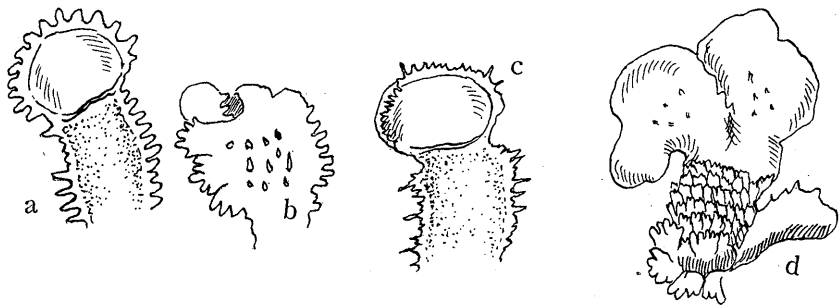

Fig. 1. *N. tropicum* (Müll. Arg.) A. Zahlbr. a. Ventral side and b. dorsal side of a lobe. *N. helveticum* Ach. v. *helveticum*. c. Ventral side of a lobe. *N. helveticum* f. *caespitosum* Asahina. d. Dorsal view of thalline fragment.

spores. Contrary to *N. helveticum* v. *helveticum* the margin of *N. tropicum* is not bordered with sharp serration (0.6—1.0 mm long, ±0.1 mm wide), but rimmed with obtuse indentation (0.6—1.0mm long, ±0.3mm wide), broader than the irregular marginal teeth of the former.

The thickness of the thallus furnishes also a key to distinguish *N. tropicum*, *N. helveticum* and its forma *caespitosum* (see below). Lichen fragments are, at first, mollified by dipping into water and after removal of excess water, held between elder-pith and cut. The sections are soaked in G.A.W. under cover glass and measured.

	Wetmore	Asahina
N. tropicum	0.25—0.29mm (under v. *sipeanum*)	up to 0.20mm
N. helveticum v. *helv.*	0.10—0.16mm	0.15—0.20mm
N. helv. f. *caespitosum*	——	0.10—0.12mm

Among 20 specimens identified by Wetmore as *N. helveticum*, excluding 3 specimens of var. *sipeanum* (=*tropicum*), there are 7 specimens belonging to *N. helveticum* f. *caespitosum*. This is perhaps the reason why Wetmore's measurement of *N. helveticum* v. *helveticum* gave lower value than mine.

Finally the dimension of spores indicates a difference between them. The measurement of spores should be done with a large number of preferably isolated ones or those located in well squeezed asci. I could only confirm the old data of Zahlbruckner: *tropicum* 20—24×5.5—6μ and *helveticum* 14—18×6—7μ.

Micrography of the contents of almost all *Nephroma* species was studied by

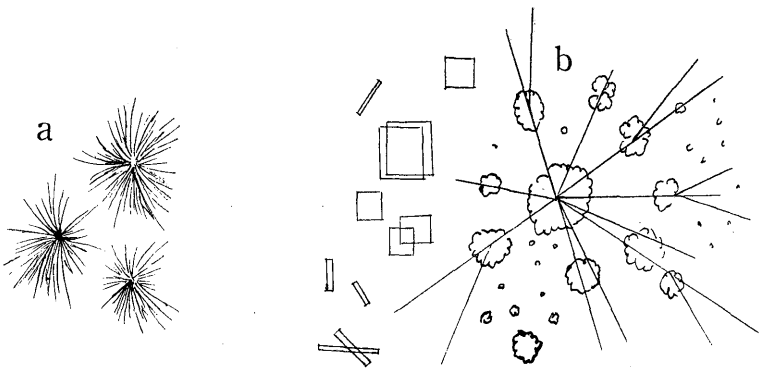

Fig. 2. a. Benzol extract of *N. tropicum* recrystallized from G. E. solution.
b. Ditto recrystallized from G. A. An. solution.

Wetmore carefully. Here I confine myself to the chemism of *N. helveticum* and *N. tropicum*, and between them I could not find any qualitative difference.

When a small fragment of *N. helveticum* or *N. tropicum* was boiled with benzene and the benzene solution was evaporated, there remains a viscous varnish like substance, which is recrystallized under cover glass from G. E. solution as well as from G. A. An. solution. From the former solvent we obtain besides oily particles radiating clusters of needles or long narrow plates; from the latter solvent long, thin needles often branched at several points (Wetmore, Pl. I. c) and after sometime thin colorless square plates (Wetmore, Pl. II. c).

Sect. Nephroma

1. Nephroma arcticum (L.) Torss. A. Zahlbr. Cat. Lich. Univ. **3**: 422.

I have examined 8 specimens from my herbarium. Except one from Takinosawa (Saghalien), growing localities are all alpine regions of Hokkaido and middle Hondo. Among 4 specimens from Faurie collection, no. 6701 (Komagatake 1905) bore rounded squamules and was referred to *N. tatranum* Gyeln. by Inumaru.

Sect. Nephromium

○ Lower surface tomentose.

2. Nephroma resupinatum (L.) Ach.

N. tomentosum Hffm. * *ramaeum* Schaer. in Nyl. Lich. Jap. p. 32.

There are 37 specimens in my herbarium, distributed in the mountainous districts of Hondo and Shikoku. I have examined also 12 specimens from Faurie collection, in which the westernmost locality was Mt. Daisen, Prov. Hoki; no specimen from Kiusiu was found.

3. Nephroma tropicum (Müll. Arg.) A. Zahlbr. Cat. Lich. Univ. 3: 442.

Nephromium tropicum Müll. Arg., Flora 1883, p. 21.—Lich. Yatabeani. no. 40. Nuov. Giorn. Bot. Ital. **24**: 192, 1892.

Nephroma Asahinae A. Zahlbr. (Feddes Repert. **33**: 35. 1933)

N. sodide-luteum Inumaru pr. p. l. c.

N. tomentellum Inumaru l. c.

N. helveticum Ach. var. *sipeanum* (Gyeln.) Wetmore—The Lichen Genus *Nephroma* in North and Middle America, Publications of The Museum Michigan State Univ. Biological Series. No. 11. p. 431, 1960.

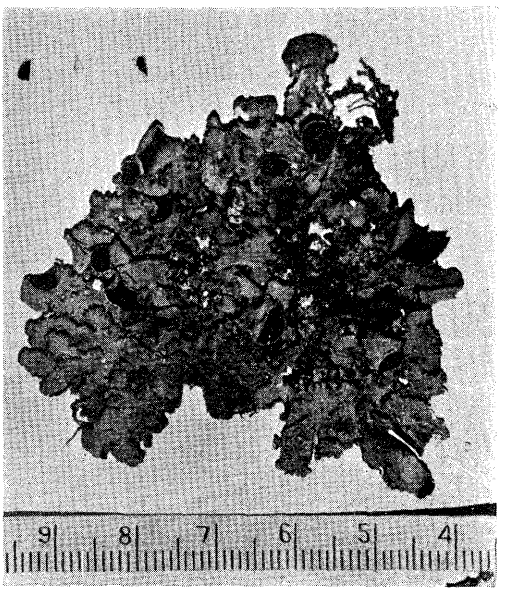

Fig. 3. *Nephroma tropicum* (Müll. Arg.) A. Zahlbr. Lich Yatabeani, no 40. Nikko no 214.

I have examined 25 specimens in my herbarium, their growing localities extending from northern Hondo to Kiusiu. Also I could pick up from Faurie collection 8 specimens recognized as *N. tropicum*, two of which (811 and 711) were identified as *N. helveticum* by Hue as well as by Inumaru and one (904) as *N. tropicum* eventually *N. Asahinae* A. Zahlbr. by the latter author. The remaining 5 Hawaiian specimens (773, 302, 574, 1080 and a specimen from Honolulu without number) were named as *N. tomentellum* by Inumaru.

4. Nephroma helveticum Ach. Lich. Univ., p. 523. 1810.
var. **helveticum** f. **helveticum.**

N. resupinatum (L.) Ach. f. *helveticum* Rbnh.

There are 41 specimens of *N. helveticum* f. *helveticum* in my herbarium, their localities extending from Hokkaido to Shikoku through main island of Japan. Among the collection of Faurie there are a few specimens from Kiusiu.

f. **caespitosum** Asahina form. nov.

N. denticulatum (non Gyel.) Inumaru l. c.

(?) *N. Murayamanum* Nyl. Lich. Japon., p. 32. 1890.

Thallus minor, semper isidiatus, isidiis squamulosis, praesertim in margine loborum caespitoso congestis. (cf. Fig. 1. d.)

Among 27 specimens of Faurie's collection, which may be referred to *N. helveticum* Ach., about one half consists of this form "*caespitosum*". They were named by Inumaru as *N. denticulatum* (Vain.) Gyel. The specimen no. 3585 Myadzu (Oct. 1901) was incorrectly identified by Inumaru as *N. Murayamanum* Nyl. (Lich. Jap. p. 32). *N. Murayamanum* Nyl. has colorless medulla[8] and as I could confirm by the fragmental piece of the "Vega collection", it should be very probably referred to f. *caespitosum* Asahina. Inumaru laid much weight on the yellow medulla of no. 3585. But the medullary layer of f. *caespitosum* As. is colored naturally more or less yellowish, but the nature of the pigment is, except K—, yet unknown. Faurie specimen no. 3585 possesed by chance a conspicuous yellow medulla.

○○ Lower surface usually etomentose.

On account of scarcity of examined specimens in this group I follow at present the treatment of Wetmore.

5. Nephroma bellum (Spreng.) Tuck. Boston Journ. Nat. Hist. **3**: 293. 1841.

Wetmore: The Lich. Gen. *Nephroma* in North & Middle America, p. 414.

N. laevigatum auct. *N. filarskyanum* Gyel.

Medulla colorless, P—.

There are 8 specimens collected in Hondo, Shikoku and Kiusiu.

f. **squamigerum** (Inumaru) Asahina

N. squamigerum Inumaru l. c.

Thallus isidiatus, isidiis squamulosis. Medulla P—.

There are 4 specimens collected in northern Hondo.

f. **flavoreagens** Asahina form. nov.

Medulla P+flavente.

There are 6 specimens from central Hondo and Shikoku.

6. Nephroma laevigatum Ach. Syn. Lich. p. 242. 1814.

N. lucitanicum auct.

Thallus squamuloso isidiatus subtus glaber, medulla flava, K+ sanguineorubra.

There are two specimens from central Hondo.

7. Nephroma parile Ach.

Nephroma parilis (Ach.) Ach. Lich. Univ. p. 522. 1810.

There are 4 specimens from central Hondo.

Medullary reaction revealed some heterogeneity: 1...K+, P+; 2...K—, P+; 1...K—, P—.

8) Annales Musei Nationalis Hungarici. 1935, p. 16.